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Report of Forty-Eight Cases of Alexander's Operation.

BY ✓
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REPORT OF FORTY-EIGHT CASES OF ALEXANDER'S OPERATION.

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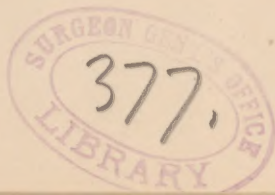
Since October 29, 1886, I have made the operation of shortening the round ligaments forty-seven (sixty-nine times, Nov. 28, 1888) times. The purpose of this paper is to give a brief summary of the immediate, and so far as determined, the remote results of the operation, some observations respecting the nature and purpose of the round ligaments, a description of a new and simpler mode of operation which overcomes the difficulty of finding the ligaments in certain cases, indications for the operation, and suggestions respecting the after-treatment of cases in which this operation has been performed.

Of this series of cases, the first twelve were reported in a paper presented at the last meeting of this Association. Another report of the first twenty cases of the series was made in a paper read before the Gynecological Section of the International Medical Congress.

The following is a classified statement of the whole series of cases, as regards local conditions for the relief of which the operation was performed :

Retroversion or retroflexion, with prolapse of one or both ovaries, 39 cases.

Complete procidentia, 4 cases.



Prolapse of ovaries, 3 cases.

Anteversion, 1 case.

RESULTS IN 39 CASES OF RETROVERSION AND RETROFLEXION.

Of these cases, nearly one-half of which were operated upon more than one year ago, four have been operated upon within three months, and although they promise exceedingly well, they cannot yet be considered as permanent successes. Of twenty-six of the remaining cases, I will say nothing more than that with one exception the patients are well, that the uterus and ovaries are in normal position, and that the symptoms for which the operation was performed have disappeared, and show no evidence of returning. In one case the operation is an anatomical success, but the patient still suffers from various local pains, which I believe to be of a neuralgic character. Each of the remaining cases, which were not wholly successful, I will notice in detail, as the unsuccessful cases are those of the greatest interest in the history of any new operation.

Miss B. Condition: sharp, rigid retroflexion, uterus double normal size, cervix just within the ostium vaginae, ovaries enlarged and prolapsed. Operation restored uterus and ovaries to proper position, but the intra-uterine stem occasioned great pain and frequently recurring epileptic seizures, so that it was removed on the third day. Two months after the operation, the uterus was retroflexed, but not so much so as before. The ovaries were out of reach, and the uterus was held well forward. The patient went home without a pessary. Was free from epilepsy for several months. Worked hard in caring for an entire family of sick persons, relapsed, and is now little better than before the operation. I think a posterior colpor-

rhaply should have been performed, and that the patient should have worn a pessary. This case was the second one operated upon and I had at that time more confidence in the sustaining power of the ligaments than I now have.

Mrs. V. Condition: retroflexion, prolapse of ovaries, and distressing reflex symptoms. The sixth case operated upon. Found ligament upon right side, but failed to draw it out. Closed wound and did not operate upon the other side. Patient is neither better nor worse than before the operation.

Miss L. Retroflexion and ovarian prolapse, the result of subinvolution. Uterus and ovaries restored to good position, but when the patient got upon her feet a small hernia appeared upon the right side. Closed this by a subsequent operation. Patient went home too soon. After a few weeks reported little relief from the operation. Has not been heard from for several months. The ligaments in this case were very small.

Mrs. M. Retroversion and prolapse of ovaries. Ligaments extremely slender. One parted in the attempt to draw it out. A week after the operation, found uterus retroverted. A week later, the uterus was in normal position. Patient went home soon after the operation. Uterus remained anteverted without artificial support for three months, the patient being well enough to engage in ordinary household duties, and greatly better than before the operation. Allowed the bowels to become very constipated. Strained violently at stool during three or four weeks. Came back for examination. Found uterus partially retroverted. Adjusted a lever pessary, applied electricity daily for three weeks and patient was greatly improved. Uterus remained in position for several hours without artificial support, while before operation the

organ became retroverted after replacement as soon as the patient stood upon her feet, unless supported artificially. Patient went home wearing a lever pessary without discomfort, which she could not do before the operation. Considering the disadvantages surrounding this case, I think the operation did fairly well. This was one of the first cases operated upon.

Miss B. Retroversion and prolapse of ovaries. One ovary considerably enlarged. Organs restored to good position by the operation. Patient became homesick and went home soon after the operation. Organs in good position when last seen. Patient not relieved of pain at menstrual period, though pain was less severe than before the operation. Present condition I have been unable to learn.

Miss R. Retroflexion, prolapse, and enlargement of ovaries. Had repeated attacks of cellulitis. Constant ovarian pain. In bed most of time, very weak, anæmic, and suffered extremely at menstrual periods. Ligaments were very slender, and a month after the operation uterus was found slightly retroverted. Ovaries in good position. A lever pessary was placed and worn without discomfort. Since operation patient has had no pain in ovaries, no pain at menstruation, has gained 44 pounds in weight, and is able to walk four miles without inconvenience. She pronounces herself in perfect health, and gives the credit to Alexander's operation. So the case can hardly be regarded as a failure, notwithstanding the inability of the ligaments to hold the uterus in perfect position. I attribute the improved condition of the patient to the restoration of the ovaries to their proper place, which could not have been accomplished in any other way I am acquainted with.

In three other cases I have had a similar experience as regards the failure of the ligaments to hold the uterus perfectly in position. These were all cases of retroflexion, in which the intra-uterine stem gave pain or created so much reflex disturbance as to necessitate its removal. The ovaries were well held up, however, in each of these cases, and serious reflex disturbances, as nausea and vomiting at the menstrual period, or after, disappeared after the operation and have not returned. A pessary can now be worn without inconvenience, although before it could not be tolerated for twenty-four hours. These cases may fairly be regarded as at least partial successes. In summing up the results of thirty-nine cases of retrodisplacement and ovarian prolapse, I may say that twenty-six were wholly successful, seven were improved, and only two were total failures, four being yet undetermined. I hope to have the opportunity to operate again in one of the cases of complete failure, and believe success may be secured.

RESULTS IN 4 CASES OF PROCIDENTIA.

Mrs. R. Complete procidentia of seven years' standing. I had temporarily relieved the patient three years before by a posterior colporrhaphy, but after a second child-birth, the difficulty returned. Operated October 29, 1886. Found ligaments very slender, but the uterus and ovaries were held well in place. Patient went home in six weeks, against my protest, and in spite of my earnest advice, would not wear a pessary. Remained well, notwithstanding, with uterus in good position, for six months, or so long as she took good care of herself. Then the patient engaged in business which required her to be much upon her feet and the old condition soon gave evidence of

returning. The patient now reports herself about as bad as before the operation. The patient should have had the posterior colporrhaphy repeated, should have worn a pessary, and should have remained under medical care for a few months after the operation.

Mrs. N. A case of complete procidentia, enormous rectocele and cystocele. Uterus could not be retained by any sort of pessary except an inflated ball, or a pessary with an external support. Found ligaments large, but could not draw them out more than $2\frac{1}{2}$ inches. Organs seemed to be well held up after operation, and all went well for several weeks, when, in straining at stool, the patient forced out the vaginal walls. The fundus was not tilted backward, but the cervix seemed to slide down under the arch of the pubes. The rectocele and cystocele which formerly existed, were but partially reproduced. I desired to perform a colporrhaphy, but the patient thought she would do well enough without it, since the uterus was held well in place by a small inflated ring pessary. The patient's condition is still about the same. Some slight improvement. Patient does not consider the operation a success though her condition is evidently anatomically better than before.

I believe that both the above cases would have been entirely successful if the proper supplementary operations had been performed. I now refuse to operate in cases of this sort unless the patient will agree that all the operations necessary may be performed.

Two other cases of the same sort operated upon more recently, in which the shortening of the ligament has been supplemented by a thorough colporrhaphy, have yielded most excellent results.

RESULTS IN 3 CASES OF OVARIAN PROLAPSE.

In the first case, Miss M., the uterus and ovaries lay in the hollow of the sacrum. The uterus was sharply anteflexed, various sorts of pessaries had been tried and either could not be worn or did no good. In operating, found the ligaments very slender indeed. One was broken. By the shortening of one ligament the fundus was drawn forward, where it has remained. The patient is relieved to a great degree of the pain which she formerly suffered after menstruation, and can wear a small lever pessary, which affords her great relief from backache and other local discomforts.

In two other cases the uterus was anteflexed, otherwise in good position, but both ovaries were prolapsed. In each case one ovary was much enlarged. The ovaries are now in normal position and no enlargement is perceptible. Tenderness and pain in the ovarian region have disappeared. Two of the three cases may be regarded as completely successful, one partially so.

RESULTS IN A CASE OF ANTEVERSION.

Patient, Miss M., aged 33. Complete anteversion. Lower border of fundus was below the arch of the pubes. Patient suffered all the inconvenience usually accompanying this condition. Operation May 31, 1887. Shortening the ligaments, lifted the uterus backward and upward fully 2 inches, where it has remained since the operation. Patient is wholly relieved and enjoys excellent health. Is a laboring woman and works steadily. Has done so for several months. Enjoys good health in every respect. No pessary or artificial support of any kind has been worn since the operation.

Summing up the results of the whole forty-seven cases, I find as follows :

Complete success in 29 cases.

Improvement in 9 cases.

Failure in 3 cases.

Undetermined, but promising excellent results, 6 cases.

I do not think the operation could fairly be considered at fault in either of the three cases of failure. In one case failure was due to want of skill or experience, or the faulty mode of operation, it being one of my first cases, and the old method being employed. Of the other two cases one was due to neglect of proper after-treatment and overdoing on the part of the patient. In the third case failure was due to want of a colporrhaphy. In at least half of the cases in which only improvement was secured, I am confident that with better after-management much better results might be secured. But that the operation fails in some cases, even when it is an anatomical success, is not a proper ground for condemnation. The same is true of many other surgical procedures. Leaving the undetermined cases out of consideration, I find the failures to be only 7 per cent., while improved cases are 22 per cent., and complete successes, 71 per cent. of the total number operated upon. This is certainly not a bad showing for a new and yet undeveloped operation.

The general skepticism respecting the value of this operation, will, I think, justify me in introducing a few extracts from letters received from patients in response to a circular letter sent out to those upon whom the operation had been performed from six to eighteen months previously. The following is an abstract from a letter from Miss R., whose case I have put down as only a partial success, as the ovaries could still be felt

after the operation, though the uterus was placed in good position :

" I feel that I must write and tell you how perfectly well I am. In fact, all my friends look upon my recovery as almost a miracle. Pains and back-aches are things unknown to me now. I walk at least a mile every day, and often three or four, and have gained 46 pounds since the operation. I shall be down in a few weeks for an examination to make sure that I am all right, Must say again, I feel simply 'elegant.' "

[Since this paper was written this patient has called upon me, and upon examination I find both uterus and ovaries maintained in good position without a pessary and the patient enjoying absolutely perfect health. No local tenderness anywhere, so that this case was after all a complete success anatomically as well as therapeutically.]

The following letter from Mrs. D. speaks for itself :

" On the 13th day of April, '87, you performed for me the Alexander operation at the Sanitarium, and now enough time has passed to know something of its effects. My good health is a marvel to both myself and my friends. I am so well, so strong, so happy in my good health ; and my heart is so full of gratitude to you for the good received at your hands. I am growing stronger all the time, thereby proving your words to be true (that I would not feel all the good effects of my operation for a year). My husband thinks that the money spent is the best investment we ever made. This reads something like the testimonials we read in the patent medicine almanacs, but I don't mean it that way, for I do this of my own free will, because I am so thankful for my good health that I must tell you so."

The following letter is from Mrs. M., who

had suffered for many years from retroversion, and flexion and prolapses of the ovaries. Operation was performed about six months previous to the date of her letter, written March 18. She still remains in excellent health :

" In answer to your letter of inquiry of March 12, I reply as follows to your questions in the order in which they are asked :

" 1. I am well pleased with the results of the operation.

" 2. I think I can safely say I am relieved of all the symptoms I suffered before the operation.

" 3. I have had no examination by another physician, and have no means of knowing the present position of the organs. I only judge from the health I enjoy that they occupy their proper position.

" 4. I do not suffer from any inconvenience which I did not experience before the operation.

" 5. I believe the operation has made me a well woman. I have not enjoyed as good health for several years. I am doing the work for my family of seven except the washing and ironing. I feel that I am able to do that also, but my husband thinks I had better wait a while longer.

" I can hardly express the gratitude I feel daily for the benefit I received from the operation."

A few days after the above was written I examined this patient and found her well, with uterus and ovaries in normal position, and in a healthy condition.

In preparing this paper for the press, I am able to report another case which I have had opportunity to examine since the paper was written, the case of Mrs. N., one of the two cases of proclivencia which were reported as failures. I found that the uterus was held forward in good

position, and that it had never been down since the operation as formerly, although there had been a protrusion of the vaginal walls. This was much better than I expected, as I supposed by reports from the patient that the uterus had fallen down as before. A small hernia which followed the operation, had nearly closed, and the operation could fairly be called at least a partial success. By the aid of a proper colporrhaphy, I feel confident that the success might have been made complete.

I give below a copy of a letter from Dr. Alexander, received since this paper was written. The letter relates to the case of Miss Y., of Liverpool, England, who consulted me for epilepsy and general ill-health. On examination, found retroversion with prolapse of ovaries. As the epileptic seizures occurred most frequently and severely at the menstrual period, and the patient suffered from the usual pains and inconvenience accompanying retroversion and ovarian prolapse, I performed Alexander's operation, hoping that both the local condition and the nervous disorder might be thereby relieved. After returning to her home, the patient consulted Dr. Alexander, who reported as follows :

Liverpool, Eng., May 21, 1888.

Dear Sir: I have just had the opportunity of examining Miss Y., one of the cases upon which you have performed the operation that goes by my name. It is with extreme pleasure that I can report the uterus and its appendages as perfectly normal in position and character, and an improvement in all the symptoms, as Miss Y. will describe herself. I congratulate you on the success, and I hope the fits will lessen in time also. But these probably depend on menstruation

itself. I am very glad to find from your letter, that you are finding the operation to be a boon when performed in suitable cases.

With kind regards,

Yours very sincerely,

W. ALEXANDER.

OBSERVATIONS RESPECTING THE NATURE AND PURPOSE OF THE ROUND LIGAMENTS.

The fact that the round ligaments are usually found in a relaxed condition, having a slack of from one to two inches, has led to the supposition that they have little to do in sustaining the uterus in its normal position in the pelvis. Indeed, the view has been advanced by some gynecologists that the round ligaments are of no value except as the morphological representatives in woman of the analogous structures in the male. Indeed, in a discussion which occurred in the Gynecological Section of the last International Medical Congress, a professor of gynecology from Canada declared that a large number of dissections which he had made, together with his experience with the operation, had convinced him that these structures were wholly absent in one-half of the women of that country. In reply to the assertion respecting the poverty of Canadian women in round ligaments, it is only necessary to state that Dr. Alexander, of Liverpool, who, at last accounts, had performed this operation nearly ninety times, has never once failed to find the ligaments. In the 47 [69] cases in which I have operated, I have failed in only a single instance, one of my earlier cases, in which I operated by the old method, cutting down upon the external ring. I abandoned the case after operating upon the right side, suspecting that my failure was due to inability to cope with peculiar

circumstances—which greater experience might enable me to overcome. I am now fully convinced that my suspicions were correct, and that I had the ligament, but failed to draw it out. I hope to have the opportunity sometime of operating upon this patient again.

In two other of my earlier cases, I had the misfortune to break a slender ligament on one side, although in both cases the remaining ligaments were of sufficiently good size to secure a very considerable degree of improvement in the patient's condition.

Omitting from the enumeration the case upon which I operated upon one side, and adding my forty-six cases to those of Dr. Alexander, we have a series of more than one hundred and twenty-nine cases, in every one of which both ligaments were present. For my own part, I should as soon expect to find about as many women wanting in ears, eyes, or ovaries, as lacking in round ligaments. I am thoroughly satisfied that these organs are among the most important of the sustaining structures of the uterus. Dr. Alexander sagaciously suggests that while the round ligaments are not continuously in action, they serve a most essential purpose in performing for the uterus the same function served a vessel by its "mooring ropes." While not sustaining the weight of the organ, they prevent its making too extensive excursions downward or backward during such acts as coughing, heavy lifting, jumping, straining, micturition, and defecation.

Strong contractions of the diaphragm and abdominal muscles during coughing, straining, and lifting, crowd the uterus downward into the pelvis with very considerable force. I have endeavored to measure this force by means of a

mercurial gauge connected with an air pessary placed in the vagina and filled with water, and found it to be equal to one to four inches of mercury, equivalent to one half to two pounds per square inch. The descent of the uterus, unless it is strongly anteverted, inclines the fundus backward more and more as the uterus descends along the curve of the pelvis. Without the restraining influence of the round ligaments, there is nothing to prevent the uterus from becoming retroverted from very slight causes, so if these structures were not present, we should find retroversion to be the normal condition of the uterus instead of anteversion. The purpose of the round ligaments is not to sustain the uterus, but, acting through the internal abdominal rings as ropes running over pulleys, they prevent the uterus from being forced so far backward as to allow the intestines, which normally lie behind the fundus of the uterus, to crowd in between the uterus and the bladder, thus producing a permanent backward displacement.

This action of the round ligaments I need not dwell upon, as Dr. Alexander has very clearly and forcibly demonstrated the correctness of this view in his monograph upon this operation, but I wish especially to call attention to what I suppose to be a new observation respecting the action of these ligaments. To perform the function of "mooring ropes," the round ligaments need to be nothing more than fibrous cords. This, indeed, seems to be the general opinion respecting their structure. The following observation proves them to be much more than this, namely, active muscular structures; which is exactly what we should expect to find, considering the matter from a theoretical standpoint, since analogy would give to the round ligaments a structure corresponding

to the cremaster muscle of the spermatic cord.

Having entertained some thoughts of this sort, I made the following experiment upon a case: After cutting down upon the round ligament, and carefully freeing it from the surrounding structures, I drew it out to the full extent, so that the fundus of the uterus was brought close up to the anterior abdominal wall. The ligament was sufficiently detached from the structures of the canal to run freely back and forth without tension upon any of the surrounding structures. I then applied electrical stimulus in each of the following ways:

1. The outer end of the round ligaments, after having been separated from its attachment, was held by an assistant 2 or 3 inches from the surface of the body, and in such a manner that it was not put at all upon the stretch. One pole of the battery was connected with a large flat sponge, placed upon the abdomen 4 or 5 inches above the wound. The circuit was closed by touching the ligament with the other electrode, which consisted of a small copper wire with a bit of absorbent cotton wound about the end and moistened. Immediately on making contact with the ligament, a very distinct contraction occurred, which involved not only the abdominal muscles, but the ligament itself. This was shown by the fact that the ligament was not simply drawn into the wound, but shortened during the contraction.

2. With one electrode placed in the vagina the result was the same, only the contraction was restricted more closely to the ligament and the muscles in the immediate vicinity of the ring.

3. To be doubly sure that the contraction of the ligament was not due to the structure being dragged in by contraction of the abdominal muscles, I carefully isolated the ligament from the body for the length of about 4 inches, and then

applied the electrical current by making contact at two points upon the ligament itself about 2 inches apart. There was distinct contraction and shortening of the ligament, with contraction of the abdominal muscles.

4. To make the observation still more positive, I cut off about 2 inches of the ligament, laid it upon a warm, moist towel, and applied wire electrodes to either end. The ligament had been exposed to the air for some time, and had been considerably bruised in drawing it out. Still, slight though very distinct contractions were obtained.

5. I afterwards subjected the portion of the ligament removed to microscopical examination, and found imbedded in its structure large bundles of voluntary muscular fibres. I did not have my stage micrometer at hand at the moment of examination but, comparing the width of the fibres with the diameter of the red blood corpuscles by means of a camera lucida, I determined their width to be about $\frac{1}{16}$ of an inch. For some weeks before examination, the structure had been preserved in a bichromate of potash solution.

In making the tests, I employed three forms of electrical current—using a galvanic current of about 6 milliampères, the faradic current, and a reversing current obtained from a small dynamo. Much the most distinct and vigorous contractions were obtained from the last named current. My first purpose, indeed, in making the observation, was to ascertain the influence of this current upon the round ligaments, as I had found it to be a most efficient agent in stimulating muscular action in other parts of the body. I think it may fairly be inferred from the above observation that the round ligaments are active as well as passive in their function. In other words, they not only act merely as tendinous cords to prevent too great

displacement of the uterus, but, when made taut by downward or backward displacement of the uterus, they aid in restoring the organ to its normal position by contracting, and thus lifting it forward. Indeed, their action is probably still more positive in the prevention of downward displacement, since the voluntary muscular fibres of the round ligaments contract simultaneously with the abdominal muscles in such actions as coughing, straining and lifting, so that the slack which is found to exist in post-mortem dissections is doubtless taken up, and the top of the fundus tilted forward at the same moment that the downward pressure is brought to bear, thus diverting the current of downward action toward the hollow of the sacrum and behind the uterus. Is it not on account of this beautiful arrangement of reciprocating muscular action that the hardy women among the peasantry of Continental Europe, as well as the female members of most barbarous tribes of human beings, are enabled to compete in physical endurance with men living under similar conditions? Their well developed round ligaments antagonize the displacing influence of other muscles in such a manner as to protect them from the disorders and malpositions of the uterus to which women of feeble muscular development, and consequently with slender and inefficient round ligaments, are so notoriously subject. In the 47 [69] cases upon which I have operated, I have invariably found the round ligaments large and well developed in women who have from early life been accustomed to such active physical exercises as are calculated to produce a good physique and well developed muscular system; while in women whose habits had been habitually sedentary, or who from early life have had their bodily movements so restricted by tight corsets as to pre-

vent freedom of movement in the muscles of the lower part of the body, I have invariably found **the ligaments slender and weak.**

A SIMPLE AND IMPROVED METHOD OF OPERATION.

In my first twenty-seven cases, the operation was performed by cutting down upon the external ring as described by Dr. Alexander. In the last twenty cases, adopting Dr. Alexander's more recent suggestion, I made the incision a little higher up, opening the canal at a point about $\frac{1}{8}$ inch above the border of the external ring, by a division of the intercolumnar fascia. I never find it necessary to make the external incision more than an inch in length. After cutting through the skin, I catch up the underlying structures on either side with snap forceps, and divide the tissues with knife or scissors down to the tendon of the external oblique muscle. Placing the end of the left finger in the wound, I locate exactly the external ring, then draw back the sides of the wound with retractors in such a way as to expose the dark line which marks the location of the intercolumnar fascia. A slight incision is made through the fascia, 3 or 4 lines in length. Taking a strabismus hook in each hand, the opening through the fascia is made to gape by drawing one side back with the hook in the left hand, while the round ligament with its investing fascia is hooked up with the right. In order to secure the round ligament, it is only necessary to adopt the following procedure:

Passing the hook down on the outside of the grayish mass which is seen through the opening in the fascia, press this mass a little toward the center of the body and push the hook down to the lower part of the canal, half or three quarters of an inch below the level of the tendon of the

external oblique. Turning the point of the hook inward, a mass of tissue is easily secured and brought out through the opening in the fascia, which will usually be recognized at once by its grayish color and the great number of anastomosing blood vessels as the structure containing the ligament. It is of great importance that the wound should be wholly free from blood, and the dissection a clean one, as by this means only will the natural color and appearance of the structures of the ligament be so preserved as to enable one to identify them. The structures hooked up usually consist of the ligament surrounded by a sheath of fascia, with its accompanying nerve and blood-vessels. To make sure that the ligament shall not escape back into the canal, from which it is not always easy to recover it, I slip a thick carbolized silk thread underneath the whole mass by means of an aneurism needle. The ends are tied together or secured by a pair of snap forceps. The next step in the operation is to carefully enucleate the ligament from the membrane surrounding it, which is easily done by the aid of a strabismus hook. On making a longitudinal slit in the fascia, the smooth, glistening surface of the round ligament is usually readily discovered, and the process of enucleation may be completed in a few minutes. In exceptional cases, the ligament, even at this point, proves to be a mere tendinous thread. On this account, great care should be taken not to sacrifice any chance for securing the ligament by cutting or breaking off any of the fibres which dip down into the canal toward the internal ring. By repeated trials, even in the most unpromising cases, a fibre will at last be found which, when pulled upon, does not drag upon the borders of the ring to which the fascia surrounding the ligament is attached. Drawing

this outward, the operator will be gratified by seeing a smooth, glistening cord emerging from the wound in the direction of the internal ring. Carefully seizing this with the thumb and finger, a little steady traction will bring the ligament fully into view. The ligament may now be dropped into the wound, being still secured by the loop of silk. Place in and over the wound a mass of absorbent cotton, saturated with four thousand solution of mercuric bichloride. After securing the ligament upon the opposite side in the same manner, both the ligaments should be drawn out to the extent of three to five inches. The pouch of peritoneum which forms the canal of Nuck will be seen gradually separating from the ligament as it is steadily pulled forward.

The next procedure is the placing of the silver wires, which should be passed through the tendon of the external oblique, crossing the inguinal canal, and including at least one half the thickness of the round ligament. Special care should be taken to include in the silver sutures the pouch of peritoneum investing the ligament. I have found two silver sutures to be sufficient. The slit in the inter-columnar fascia is now closed by two or three carbolized silk sutures. At least two of these are also made to include the ligament. Before tying the last suture, the outer portion of the ligament is tucked into the outer end of the inguinal canal. If the ligament has been greatly bruised, however, or if vessels have been tied, so that its nutrition is cut off, the ligament should be brought out through the lower angle of the wound. This is very rarely necessary, if the operator is skillful. The deep and superficial fascia are now carefully brought together by a continuous suture of small chromicized catgut. The

skin is united in a similar manner, the silver sutures twisted, and the operation is completed.

In dressing the wounds, I cover them thickly with a mixture of equal parts of iodoform and sub-carbonate of bismuth. Over this is placed a quantity of iodoform charpie, then a thick layer of sterilized cotton, and a snug body bandage, secured by perineal bands, is placed over all. The uterus is supported in position by a lever pessary, which is fitted before the operation. If necessary, this is held up by the hand of an assistant, during the securing of the ligaments by sutures. In cases of retroflexion, the fundus must be held forward by means of a sound, and afterwards kept in place by a stem pessary, unless the flexion is a rigid one, in which case rapid dilatation should be performed before the operation upon the ligaments, and a stem pessary placed in position. I have had made a self-retaining stem which I find useful in these cases.

I have operated by this method in 20 [42] cases, and have secured immediate union in every case. Great pains is of course taken to make the operation thoroughly antiseptic. The patient receives a shampoo and is shaved some hours before the operation, and a compress wet with one to four thousand bichloride solution is applied to the parts concerned in the operation. All assistants and nurses, as well as the operator, are required to wear, while in the operating room, large gowns which have been well sterilized by boiling or fumigation. The operator and all who handle instruments, disinfect the hands first by thoroughly scrubbing with hot water and laundry soap, then washing with alcohol or ether, and finally soaking for a minute in a $\frac{1}{2}$ per cent. bichloride solution. The wounds are kept continually moistened by frequent sponging during the opera-

tion with one to four thousand bichloride solution.

With the exception of one case, 100.6° F. is the highest temperature shown by any case operated upon in this manner, (now twenty in number,) and the temperature has reached 100° F. in only a few instances.

Another advantage of this simple mode of operation is that it can be performed without ether. The incisions are so small, usually only just large enough to admit the end of the finger, that cocaine answers all requirements for anaesthesia. In my last 18 [46] cases, I have used ether but twice. The patients complain of no pain except for a few seconds at the last, when the ligaments are being drawn out. I usually inject fifteen or twenty minims of an 8 per cent. solution of cocaine under the skin along the line of the first incision, four or five minutes before beginning the operation. No more cocaine is required, as a rule, until the deep fascia is reached. A few minims are dropped over the deep tissues before making the last incision. A few minims more are injected into the inguinal canal before picking up the ligament, and again the needle of the syringe is passed into the canal in the direction of the internal ring, just before drawing the ligaments out. The total amount of cocaine used in a case is usually three to five grains.

Another advantage in the use of cocaine is the fact that the patient is not troubled by subsequent vomiting, as when ether is used. The pain occasioned by the pull upon the ligaments in the straining of a single spell of vomiting after ether, is much greater than the entire amount of pain ordinarily suffered during the operation under cocaine. Patients frequently read a newspaper or a book, or converse jovially with friends during the operation, and declare that they should not

be aware from the sensation that any operation was being performed. The great safety of this operation when performed antiseptically, the little pain involved in it, and the elimination of the small danger involved in the use of ether, by the employment of cocaine, certainly commend to the consideration of gynecologists the question whether so safe and simple a procedure is not greatly to be preferred to dependence upon pessaries, which, at the most, are, with rare exceptions, merely palliative, and are not infrequently attended by great distress and inconvenience on the part of the patient who resorts to their use.

After the operation, the patient is put to bed, a vaginal douche is administered every four to six hours during the day, and one during the night if the patient suffers pain. A narcotic is rarely required. The use of a catheter is seldom necessary, as the patient evacuates the bladder without straining while taking the douche. Before the operation, the patient's bowels are thoroughly evacuated by means of an aloine pill given the night before the operation, and a saline laxative the next morning. The bowels do not move after the operation for two or three days, and then are kept loose by castor oil or some similar laxative. Defecation is aided by warm water enemata, so that no straining is allowed. The silver sutures are removed the seventh or eighth day, until which time the dressings are not disturbed. I never use drainage tubes, and see no necessity for their use in this operation. The patient is kept in bed for three or four weeks after the operation, receiving daily massage and general faradization.

At the end of one month, the patient is allowed to get upon her feet, and a course of treatment is begun for the purpose of preventing a relapse into the former condition. Alexander's operation is

not to be considered as a radical cure of any form of uterine displacement, but only as a most efficient aid to other means. It restores the uterus to its normal position, and gives it, so to speak, a new chance to stay there if it can. Whether or not it will remain in the position to which it has been restored, depends upon whether other normal conditions, causative and resultant, are or may be removed.

When may Alexander's operation be advantageously employed? In answering this question from the results of my own experience, I should say:

1. That the greatest utility of this operation is in cases of retroflexion and retroversion of long standing, and especially cases in which the uterine displacement is accompanied by prolapse of the ovaries, making the wearing of a pessary painful or intolerable. I think it not improper, however, that a woman who is found to be suffering from retroversion or flexion, without any ovarian complication, should be given an opportunity to choose between an operation which restores the uterus to its normal position, and gives it a fair prospect of remaining in this condition, and many years, or a lifetime, of dependence upon a pessary, and possibly also upon a specialist to inspect, adjust, and change the supporter to suit varying conditions from year to year.

2. Cases of procidentia, provided the operation is supplemented by other necessary operations, as posterior or anterior colporrhaphy, or both. I am satisfied that much of the prejudice against this operation which exists among physicians is the natural result of too great confidence felt in the operation and the extravagant claims made for it by some of those who were among its early advocates. I think it is now pretty well agreed that

Alexander's operation affords only a temporary relief to the subject of complete procidentia unless proper supplementary operations are performed. I have devised a modification of the posterior colporrhaphy of Simon which I find very successful in these as well as other cases requiring a posterior colporrhaphy. The operation consists in the removal of a strip of mucous membrane of proper width upon the posterior wall of the vagina, extending from the labia to a point an inch below the level of the cervix, when the latter is held in its normal position. The inner end of the denuded surface is continued laterally on either side by extending the denudation one-third the circumference of the vagina each way from the median line. Beginning at the apex of each of these cornua, the denuded surface is closed up, first by buried sutures, then by a continuous suture uniting the edges of the mucous membrane. By this means, not only is the vagina narrowed, but a thick strong raphe is made running along the posterior wall, forked at its inner end. The forked end forms a pouch into which the cervix drops, and being prevented from further descent, the action is to tilt the fundus forward, thus aiding the action of the round ligaments. An anterior colporrhaphy is also performed when there is much anterior bulging. I find the use of the buried suture of great advantage in this operation as well as the form given the denuded surface. This mode of procedure may be old to others, though new to me. I have taken the liberty to describe it thus briefly in this paper, as I believe a colporrhaphy to be equally as important as Alexander's operation in all cases of procidentia, and also in cases of retroversion attended by vaginal subinvolution; and in the dozen cases in which I have used this method, I have found the results much

more satisfactory than other methods which I had previously employed. (See Figs. 1 and 2.)

The expectation from Alexander's operation is not that the ligaments will permanently hold the uterus up, but that they will hold it forward for a sufficient length of time to allow the pelvic contents to rearrange themselves in normal positions; and if the natural supports of the organ can at the same time be restored, a cure will be accomplished; otherwise the patient will assuredly drift back, in time, into the old condition. It is not the normal function of the round ligaments or muscles to sustain the uterus; but we have shown by experiment that their strength is amply sufficient to enable them to be used temporarily for this purpose. Nevertheless, no intelligent gynecologist would think of depending upon these frail muscular bands as a permanent support for both the uterus and a large part of the abdominal contents. I speak of this, not for the information of this audience, but as a defense against damaging impressions which I have found existing among physicians that Alexander's operation is claimed by its advocates to be a radical cure for procidentia and all its grave consequences.

3. As at least third in importance, I should rank the utility of this operation in the restoration to proper position of enlarged and prolapsed ovaries, when painful and a cause of serious reflex or local disturbance, irrespective of the position of the uterus itself. In forty-two of the forty-seven cases upon which I have operated, the ovaries have been prolapsed. In fifteen of these cases one or both prolapsed ovaries has been very much enlarged. In two instances the enlarged ovary was as large as a very large egg. In every instance, with barely two exceptions, the prolapsed ovaries have been so perfectly restored that they

could not be felt in vaginal examination after the operation. The rescue of this sensitive organ from its perilous position—crowded down behind the uterus, exposed to the pressure of hardened fæces and the jar of every misstep in walking, as well as the passive congestion due to the mechanical obstruction to its circulation, and its restoration to its normal and protected position, is in itself the first step, and the most important step, toward the restoration of the ovary to a normal condition in other respects. I am convinced that a very large part of the good results which I have seen from this operation should be attributed to the restoration of the ovaries to their normal position, rather than to the change in the position of the uterus.

The existence of anteflexion or anteversion is not a contraindication for the operation, at least in my experience, if needed for the restoration of a prolapsed ovary. I have operated twice in cases in which this condition existed, without in the least degree aggravating the anterior displacement; and although it has been my uniform rule in operating to draw the ligaments out as far as possible without undue force, I have not produced a harmful degree of anteversion in a single instance.

4. I offer, as a fourth indication for this operation, extreme anteversion of the uterus when the patient suffers much from bladder disturbance. The results in the one case of this sort, first reported at the last meeting of this Association, have been all that could be desired, and I see no reason why equally good results may not be obtained in other cases.

The operator who wishes to succeed with Alexander's operation, must not consider that when the operation is done, every thing has been

accomplished. The shortening of the round ligaments should be regarded simply as a procedure for securing conditions favorable for the success of other means of treatment, which, without it, could not be permanently successful. I will briefly summarize what I believe to be the most essential features of the successful after-treatment of cases of this sort :

1. After the operation for the shortening of the ligaments, and the colporrhaphy or perincorraphy, or both, in cases requiring these operations, have been performed, a suitable pessary should be worn for six to twelve months, so as to remove all strain from the uterine ligaments and give them an opportunity to shorten, and prevent the round ligaments from being stretched to their original length. In my earlier cases, not appreciating the full value of the pessary in the after-treatment of these cases, I failed to obtain the best results in some cases which I believe would otherwise have been entirely successful.

2. The use of the vaginal douche for several months following the operation, I consider a very important means of aiding the contraction of the uterine ligaments and the return of the uterus and ovaries to their normal condition. Medicated pledgets of cotton may also be advantageously employed in many cases.

3. Another measure which I consider one of the most important of all in securing such a degree of improvement as will insure the patient against a speedy relapse into the former condition, is the correction of faulty modes of dress. It is not simply necessary to discard the corset, as I am satisfied that tight waist-bands and heavy skirts do more harm than do corsets. I have met many cases in which women who had discarded corsets, have injured themselves greatly

by wearing numerous heavy skirts, drawn tight, and hanging upon the hips and lower abdomen. Skirt suspenders do not wholly remedy this evil, unless the skirt and dress bands are very loose; and every experienced physician knows that the average woman does not know when her clothing is loose. My rule is to make the patient take a full breath when the skirts and skirt-bands are loosened, take a measurement of the waist while the breath is held, with the lower portion of the chest expanded as much as possible, add one inch to this measurement, and adopt this as the standard measurement for skirt-bands and all clothing about the waist. I have made some measurements of the amount of downward pressure produced by corsets, waists, skirt-bands, and other articles of clothing, and in one instance found the column of mercury raised to twenty inches during forced inspiration. This means a pressure equal to ten pounds per square inch. With such a pressure as this bearing downward upon the uterus and other pelvic organs, no permanent gain could be hoped for by means of Alexander's or any other operation, unless it be that of attaching the fundus of the uterus to the anterior abdominal wall.

4. Lastly, as another most important means for the prevention of a relapse into old conditions after this operation, may be mentioned electricity and massage, and such special active and passive exercises as will strengthen and develop the abdominal muscles and the normal supports of the uterus and other pelvic viscera. For a dozen years, I have employed electricity extensively in the treatment of uterine displacements of various sorts, sometimes with very satisfactory results, at other times without apparent effect in the direction of the improvement of displacements. Com-

binning this agent with Alexander's operation as a supplementary therapeutic means, affords a more favorable opportunity for good results.

I have employed different forms of currents, the faradic current, the slowly interrupted galvanic current, the galvanic and faradic currents combined, and the dynamic current. The latter current, supplied by a small machine giving a reversing current, I have found the most effective of all means of stimulating contraction in the muscular structures which support the uterus. When one electrode is placed upon the abdomen and the other in the vagina, energetic and painless contractions are produced in the abdominal muscles, the sphincter muscles of the rectum and vagina, and the other muscular structures within the pelvic cavity. Experiments made with this current on a patient under ether and with the round ligaments exposed and isolated, showed contraction of these structures also when the electrodes were applied as indicated. If it be true, as has been suggested, that other of the ligaments of the uterus as well as the round ligaments, are to a considerable degree, muscular in their structure, I deem it wholly probable that these also participate in the contraction. These contractions occur at every reversal of the current, so that this current not only has the effect to stimulate nutritive changes in the diseased structures, but also affords a most valuable means of securing functional activity in idle and relaxed parts, thus giving them the benefit of a genuine gymnastic exercise. The therapeutic results following the use of this current justify me in claiming for it a decided superiority over any other form of electrical current for this purpose. I have used this current for medical purposes for the last five years, and in the after-treatment of

cases in which the round ligaments have been shortened during the last year.

Massage, combined with faradic electricity applied in such a manner as to secure contraction of individual muscles and groups of muscles, is also a measure of great service, not only in securing the general improvement of the patient, but more directly, when localized in its application, as a means of strengthening the abdominal muscles and aiding the readjustment of the abdominal viscera to a normal condition. Massage is also a most potent means of relieving the obstinate constipation with which a large proportion of persons requiring this operation habitually suffer, and which will almost certainly occasion a recurrence of the displacement unless relieved.

Light calisthenics, exercises with Indian clubs and dumb-bells, pulley weights, etc., are of essential service. In fact, a regular systematic course of physical culture, or appropriate gymnasium training, is, in my opinion, necessary to fully insure a woman who has once suffered from uterine displacements from an ultimate recurrence of the condition. These patients often have an original defect in organization, a lack of physical development, or at any rate of a symmetrical development which predisposes them to uterine displacements. A young woman who has failed to develop strong abdominal muscles, who has not been allowed to run, jump and romp, and harden the muscles of the trunk and limbs when a girl, is a candidate for retroversion or flexion, or ovarian prolapse, or some allied malady as soon as she is obliged to endure any sort of physical hardship. This is, in my opinion, the reason why so many young women attribute all their ailments to going up and down stairs at school. I see no reason why a woman may not go up and down stairs as well

as a man if her muscles are properly developed. Stanley asserts that the strongest porters in some portions of Africa are women. Inquiry in the hospitals of France, Germany, and Italy convinced me that uterine displacements are much less common among the women of the laboring classes of that country than in this country. If then, we have performed the operation of shortening the ligaments upon a woman whose physical development has been neglected, we must not be content with making her as well as before the displacement occurred; we must make her better than before, or the same morbid conditions will follow the same causes. If, then, instead of sending away a patient upon whom the operation of shortening the ligaments has been performed, with the same weak and unbalanced muscular condition as before, we subject her to a series of carefully graded exercises by which weak parts are strengthened and feeble parts developed, we prepare her to endure without injury those physical hardships, muscular strains, etc., which she must necessarily encounter, and thus insure her against the relapse which otherwise will almost inevitably occur.

Pursuing this plan in the management of cases upon which Alexander's operation has been performed, I am sure that radical cures may be effected in numerous cases which by other means could only be palliated. As an essential aid to curative gynecology, I believe this operation is destined to prove a most valuable addition to this branch of medicine; and I feel confident that its proper employment in conjunction with other measures of treatment, and especially the appropriate after-treatment of cases, will in due time wear away the prejudice which has arisen against the operation through the neglect of the use of the supplementary measures necessary to secure to the pa-

tient operated upon the great benefits which might otherwise have been secured.

[Since the above paper was written I have performed the same operation in twenty-two additional cases, making sixty-nine in all. At the present date I find in the total number but four failures, ten much improved, and fifty-five complete successes. Of the last forty cases, there has been failure in but one case, and this was due to an accident in which the patient was led to exert herself so violently just after getting upon her feet subsequent to the operation, that the ligaments were torn loose. The total percentage of successes, including my first series of twenty-nine cases by the old method, is eighty. J. H. K.]

